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Nanoporous celluloses, previously unknown forms, as the best primary feedstocks for energy, chemical and agricultural feed production

We have developed a proprietary process for transforming celluloses into previously unknown nanoporous forms. The process is carried out at ambient temperature and pressure by a method that uses only water, ethanol, sodium hydroxide and carbon dioxide. Thus, both capital and operating costs are far less than those of traditional high-temperature and high-pressure biomass pretreatment processes. The products are easily converted to monosaccharides that can be used as feedstocks for biosynthetic processes for fermentation to fuels or for other organic synthetic processes. The process can also convert low-value agricultural residues into nutritious feeds for ruminant livestock. The effectiveness of the transformation is reflected by reduction of the enzyme dosages necessary for hydrolysis to monosaccharides by an order of magnitude. When applied to agricultural residues the process increases their digestibility by ruminants from 30-90%. We will describe the process and present results that reflect its effectiveness.

Biography

Rajai H Atalla has completed his PhD in Chemical Engineering and Chemical Physics from University of Delaware, USA. He has 40+ years of experience in research on cellulose and lignocellulose. He has served as a Consultant to many companies in the forest products and cellulose sectors. He has undertaken research under contract for National Renewable Energy Laboratory (NREL) and served as a Member of working group for US Department of Energy. He has also served as a Professor of Engineering and Chemical Physics at Institute of Paper Chemistry in Appleton, Wisconsin. In 1989, he became Head of Chemistry and Pulping Research at the USDA Forest Service Forest Products Laboratory in Madison, Wisconsin and Adjunct Professor of Chemical and Biological Engineering at the University of Wisconsin, Madison. He has established Cellulose Sciences International (CSI) in 2007 to undertake research for NREL and develop the CSI process. He has well over 200 peer reviewed publications, book chapters and patents to his credit.

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